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Research Article

Comparison of *Helicobacter pylori* infection frequency in the cardia and distal esophageal cancer patients with healthy individuals

Iraj Feizi-Khankandi[1], Amin Rezazadeh[1]*, Farideh Feizi[2], Ehsan Seyedhatami[3]

[1]Department of Surgery, Faculty of Medicine, Ardabil University of Medical Science, Ardabil, Iran
[2] Imam Khomeini Hospital, Ardabil University of Medical Science, Ardabil, Iran
[3]General practitioner, Ardabil University of Medical Science, Iran

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***Correspondence:**
Dr. Amin Rezazadeh,
E-mail: a.rezazadeh@arums.ac.ir

ABSTRACT

Background: *Helicobacter pylori* is a bacterium that detaches from human beings all over the world, i.e., human being is the largest reservoir of this organism. The aim of this study was to investigate the prevalence of infection among patients with esophageal and gastric cardia cancers and healthy people.
Methods: This case-control study was done on 144 persons who were divided into two groups (72 persons in each group). The control group included cases with normal endoscopy and the second group involved patients with gastric cardiac and distal esophageal cancer. Patients were sent to a lab to take stool samples. After receiving the lab reports, information was entered in the checklists and then was analyzed via statistical methods using SPSS 19.
Results: The percentage of male cases in was 59.7% in case group and 48.6% in control group. The mean age of all patients was 64.2. In the case group 40.3% of patients were smokers and while this percentage was 23.6% in control group. The most common clinical symptom was dyspepsia in 94.4% of the patients. 27.8% of the individuals in the case group and 22.2% of those in control group were with positive gastrointestinal cancer history in family. 45.8% and 54.2% of patients were with cardia and distal esophageal cancer respectively. The incidence of *H pylori* infection in the case group was 37.5%, which was lower than the control group being 58.3% (p=0.012, OR=0.4, 0.2-0.8).
Conclusions: The results showed that *Helicobacter pylori* infection may play a protective role in the development of esophageal and cardia cancers.

Keywords: *Helicobacter pylori*, Cardia cancer, Esophageal cancer, Ardabil

INTRODUCTION

Helicobacter pylori is a bacterium that detaches from human beings all over the world, i.e., human being is the largest reservoir of this organism. In developing countries, up to age 10, 70 percent of people is colonized with this bacterium. The association of infection with the bacterium and occurrence of duodenal and gastric ulcers, cancer and gastric lymphoma is proven.[1-3] Epidemiological studies show that the cumulative incidence of esophageal epithelial tumors, including squamous cell carcinoma and adenocarcinoma of the esophagus are increasing in many areas with a similar rate of prevalence and incidence.[4-6]

Eslami et al in a study examined the relationship between *Helicobacter-pylori* and gastric cardia cancer and detected a very weak relationship between them.[7] In the cardia and non-cardia gastric cancers the risk estimation of HP infection depends on study design, follow-up

duration, age at diagnosis and HP genetic chain.[8-11] The research studies on HP infection and esophageal malignancies/cancers have shown contradictory results indicating that the incidence rise of esophageal adenocarcinoma is more likely to be effect of the reduction in the prevalence of HP infection.

Due to the high incidence of esophageal and gastric (cardia) cancers in Ardabil province, this study aimed at investigating the prevalence of infection among patients with esophageal cancer, gastric cardia and healthy people.

METHODS

This case-control study was undertaken over 144 patients who were assigned into two groups (control and case groups) with 72 cases in each one. The control group consisted of those with normal endoscopy and the case group included the patients with cancer of distal esophagus and gastric cardia cancer who were diagnosed and chosen for the study. The individuals in the control group were matched with the patients in the case group, in terms of age, sex and place of residence. Patients who met the inclusion criteria (having esophageal cancer, gastric cardia cancer, and normal endoscopy in the control group) were sent to the laboratory for providing stool samples. Subsequently, HP diagnostic tests were performed on the samples. The exclusion criteria were having a history of HP eradication, previous surgery on the stomach or the esophagus because of gastrointestinal cancers, being on antibiotics and PPI over the last month. Data obtained from the laboratory as well as patients' personal data, were employed to be analyzed by T-test and Chi-square, and descriptive statistical methods, using SPSS v19. Then the data were presented in the form of tables and graphs. In all tests, the significance level was considered less than 0.05.

RESULTS

The number of males was 43 (59.7%) in the case group and 35 (48.6%) in the control group. The mean age of patients was 66.7±9.4 in the case group, and 64.2±10.44 in the control group. The age ranges of (70-80) in the case group and (50-60) in the control group were more common than other age ranges in terms of incidence of the cancer. There was no significant difference between individuals in two groups relating to height, weight and BMI. The results showed that 20 patients (27.8%) in the case group and 16 patients (22.2%) in the control group had a family history of cancer (Table 1).

The most common symptom in patients with gastrointestinal cancer was dyspepsia that was seen in 68 patients (94.44%) (Figure 1). The case group embraced 33 patients (45.8%) with cardia cancer, and 39 patients (54.2%) with distal esophageal carcinoma. The most common involvement area in patients with cardia cancer was adenocarcinoma i.e., 25 out of 33 patients (75.8%), and in patients with distal esophageal carcinoma was SCC, i.e., 30 cases out of 39 patients (77%) (Figure 2).

The results manifested that the incidence of HP infection in the case group (37.5%) was significantly lower than the control group, 58.3% (Figure 3) (OR = 0.4; CI = 0.2-0.8).

Regarding the location of the lesion in the case group, 55.6% of the patients developed infection in the distal esophagus and 44/4% in the cardia which was not indicator of statistically significant difference between two locations. In the case group, the number of males with HP infection was greater than women, and this difference was statistically significant (P = 0.016) (Table 2). The average age of infection was not significantly different between two groups

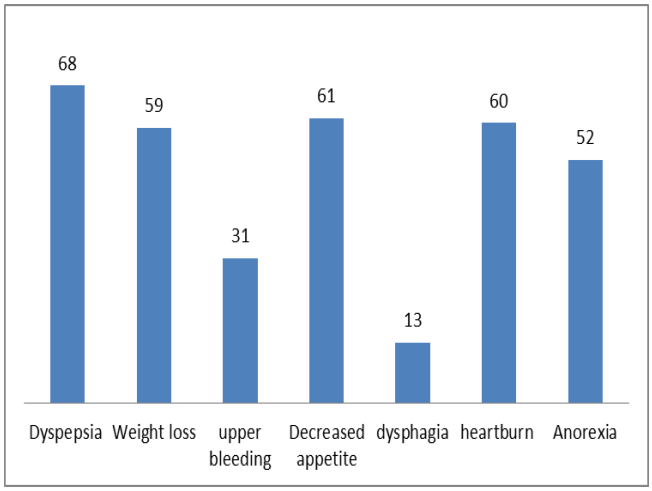

Figure 1: Frequency of symptoms in case group

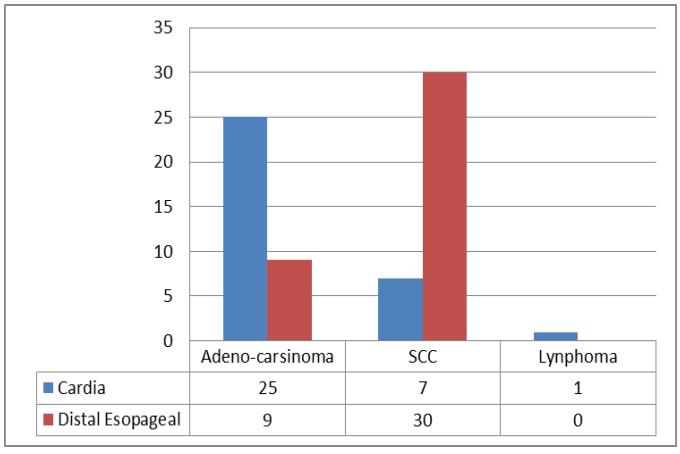

Figure 2: The frequency of case group by involvement location.

Table 1: Demographic variables of study groups.

Variables		Case		Control		p-value
		N	%	N	%	
Sex	Male	43	59.7	35	48.6	0.18
	Female	29	30.3	37	51.4	
Education	Illiterate	66	91.7	31	43	0.001
	With-illiterate	6	8.3	41	57	
Family history of cancer	+	20	27.8	16	22.2	0.001
	-	52	62.2	56	77.8	
Age groups	<60	32	44.4	27	37.5	0.148
	60-70	15	20.8	13	18	
	>70	25	34.8	32	44.5	
Job	Employee	3	4.2	7	9.7	0.38
	House-keeper	26	36.1	27	37.5	
	Self-employment	43	59.7	38	52.8	
Daily behavior	Smoke use	29	40.3	17	23.6	0.001
	Tea use	27	37.5	54	75	
	Alcohol and Opium use	16	21.2	1	1.4	

Table 2: Relation between sex and *H-pylori* incidence rate.

Group \ Sex		+		-		p-value
		N	%	N	%	
Case	Male	21	48.8	22	51.2	0.016
	Female	6	20.7	23	79.3	
Control	Male	19	54.3	16	45.7	0.498
	Female	23	62.2	14	37.8	
Total	Male	40	51.3	38	48.7	0.38
	Female	29	43.9	37	56.1	

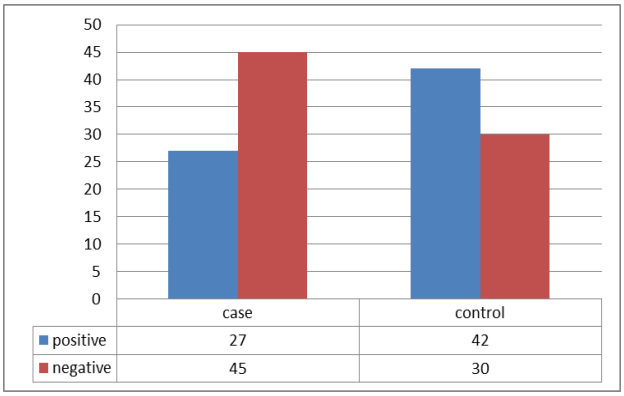

Figure 3: *H-pylori* infection frequency in two study groups.

DISCUSSION

The percentage of males was 59.7% in the case group and 48.6% in the control group (P=0.181). The mean age of patients was 66.66 in the case group and 64.15 in the control group (P=0.240). The results of the present study were in line with those of other studies.[13,14] In this study the incidence rate of infection in the case group was greater than that of the control (p=0.012). Furthermore, similar to other studies, it was observed that, two groups, totally, didn't have any meaningful relationship in terms of age (P=0.608), sex (P=0.380) and occurrence of HP infection.[13-15] In the present study, no meaningful relationship was discovered between incidence of infection and the location of malignant lesion in the case group. Ye and colleagues in their study demonstrated that HP may lead to decreased risk of esophageal adenocarcinoma on the one hand; and increased risk of SCC for esophageal adenocarcinoma and cardia.[16] They also showed that atrophy of the stomach is not a risk factor for adenocarcinoma and can increase the risk of esophageal SCC. Chow and colleagues found no significant association between the incidence of HP infection and non-cardia gastric cancer (OR, 1.4; CI, 0.7-2.8), but they showed that this infection could significantly reduce the incidence of cardia and esophageal cancers (OR, 0.4; CI, 0.2-0.8).[17] In the study undertaken by Simán and colleagues, it was observed that the incidence of HP infection was significantly associated with gastric adenocarcinoma (OR = 17.8; 95% CI: 4.2-74.8; 67), however, there was no relationship between adenocarcinoma of the esophagus and cardia and HP infection and Cag A.[18] Although the study conducted by de Martel et al illustrated significant relationship between the incidence of esophageal cancer and smoking (p=0.003) and BMI (P=0.003), it couldn't detect any meaningful relationship between alcohol consumption, education, HP serology and Cag A serology, and the incidence of esophageal cancer. Wu et al in a study showed that smoking, BMI, being seropositive for HP increases the risk of non-cardia gastric cancer, and this

rise is accompanied by the increase of Cag A (OR = 1.85, CI = 1.03, 3.32) but does not heighten the risk of developing esophageal and cardia cancers.[19] It was also observed that when HP accompanies Cag A, the incidence rate of esophageal and cardia cancers does not increase, but this association entails the increased incidence of non-cardia gastric cancer. In a study, Wu et al also revealed that HP infection lowers the incidence rate of esophageal SCC, whereas it significantly raises the incidence rate of cardia and non-cardia gastric cancers in comparison to colon cancer.[20] No association was found between the incidence of infection and esophageal SCC. In the study conducted by Anderson et al a relationship between decrease in the incidence of esophageal adenocarcinoma and being seropositive for HP has been reported (OR = 0.49; CI: 0.3,0.7).[21] It was also observed that atrophic gastritis in patients with esophageal adenocarcinoma was lower than control subjects, but this reduction was not statistically significant. Whiteman et al in their study observed that the incidence of esophageal adenocarcinoma (OR = 0.45; CI: 0.3-0.7) and cardia (OR = 0.4; CI: 0.3-0.6) was lower in patients with HP infection; however, the incidence of HP infection didn't have relationship with esophageal SCC.[22]

CONCLUSION

The results of the present study in similar to other studies showed that the rate of HP infection in patients with esophageal distal cancer and cardia significantly lower than control group. There was a positive relation between *Helicobacter pylori* infection and decreasing esophageal distal cancer and cardia.

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